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INTERNET

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An introduction to ISDN

In most parts of the US and in many European countries, you can connect your computer to the world with a super-fast technology called ISDN (Integrated Services Digital Network). It lets you work with more information faster and more efficiently than you'd ever dream a traditional phone line and modem connection could.

But there's more. ISDN opens a whole galaxy of possibilities, including video conferencing, the ability to let two people in remote locations work on the same project, digital audio transmission, and a multitude of other opportunities—as well as providing traditional voice phone service.

In this article, we'll introduce you to ISDN technology and give you some idea of its power. We'll also compare ISDN to traditional modems and phone service and list some of the hardware you can use with ISDN in your home or office. Let's begin by exploring why you might want ISDN.

Mighty morphin' ISDN power

Speed is one distinct advantage ISDN has over traditional modem connections. Documents that once took hours to send with regular modems can transfer in minutes with ISDN. Graphic designers and engineers can collaborate on designs without waiting for overnight delivery service. Telecommuters, advertising agents, lawyers, students, writers, and business people can take advantage of this technology to manage tasks from home

or remote offices rather than scheduling trips to do so.

Another advantage is ISDN's practically noiseless connection. Digital signals are far less likely to suffer from line problems than traditional analog phone connections.

What's more, ISDN can work over the same wires that currently drive your regular telephone. ISDN can even replace your current phone line. If your local phone company can provide you with ISDN service, you can easily upgrade to—or add—an ISDN phone line in your home or office.

How ISDN works

ISDN is a completely digital connection—all the way from the phone company to you. This is a big improvement over today's phone service. To see the advantages of ISDN's digital connection, you need to know a bit about how traditional phone service works.

The average phone requires an analog connection—that is, sound that pumps through a phone (or out of a modem) in a series of electrical currents similar to what drives speakers and microphones on a stereo. This analog signal isn't very efficient, can be difficult to transmit clearly over long distances, and takes more time to reach a destination than its digital counterpart.

The phone companies once used only analog equipment to transmit sound, as shown in **Figure A** on the next page. After a while, they discovered that if they converted

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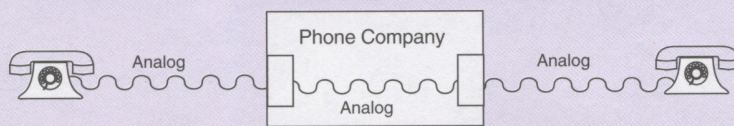


sound to a digital format at the central office, they could transfer that audio information from place to place faster and more efficiently.

Today, most phone services use a hybrid of analog and digital technologies. Your phones and modems send out a raw, inefficient analog signal. As shown in **Figure B**, the phone company converts the analog signal into digital form once it reaches the switching equipment at the central office. The phone service converts the signal back to analog before the connection reaches the destination phone or modem.

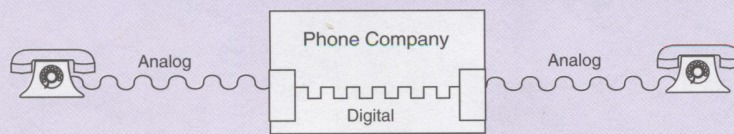
An advantage to this analog-to-digital-to-analog conversion is that it's cheap to implement and easy to maintain. However, the cost is mediocre sound quality because the audio doesn't need to be exact. Modems are severely limited by this poor sound quality as well. The human ear and mind can easily handle inconsistencies in signal quality. Your modem, however, isn't quite as smart as you are and requires more clarity.

Figure A



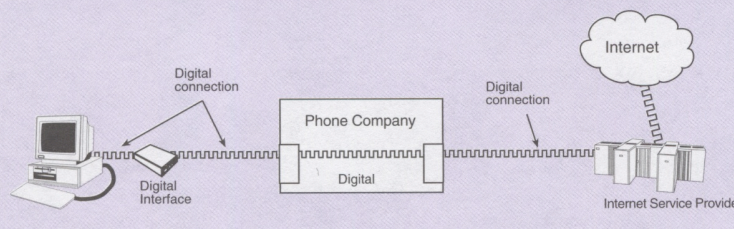
Once, only analog service was available through regional phone companies.

Figure B



Most phone-based communications today consist of a hybrid collection of analog and digital conversions.

Figure C



ISDN's completely digital connection allows your computer to transmit and receive information without the limitations and problems inherent in regular phone lines.

Computers just can't process information like humans can. Even the slightest noise or a momentary interruption can create critical errors in a computer signal that will cause your modem to disconnect. That's one of the problems with using modems in conjunction with analog phone lines.

Because the phone company restricts the audio quality an analog phone connection can produce, it also limits the amount of data a modem can squeeze into those analog lines. Since moving data is what the Internet is all about, your modem is often the tightest bottleneck in your Internet connection. This bottleneck can turn your surf through cyberspace into something akin to a slow canoe trip.

Your computer can move much more information than a standard modem can fit into the archaic analog phone line. ISDN completely eliminates the analog-to-digital and digital-to-analog (AD/DA) conversions, thus providing your computer the capability to push more data than a standard modem would allow.

As **Figure C** illustrates, the ISDN connection is completely digital. Your signal isn't limited to the narrow constraints of an analog phone line's "last mile" from the central office to your home or business. Also, your connection doesn't lag as a result of the AD/DA conversions, which impose their own sets of costs and inefficiencies. For your Internet surf sessions, ISDN's digital connection means more dependable Internet connections at much higher speeds.

Zero to 64 in seconds

Since ISDN provides a completely digital connection from one point to another, your connection is very fast. As a matter of fact, a basic-rate ISDN, or BRI (basic rate interface), line provides a multichannel digital connection that consists of three separate channels: two 64-Kbps (kilobits per second) B (bearer) channels and one 16-Kbps D (Delta) channel, commonly referred to as 2B+D. (Another word for the amount of information measured in Kbps is *bandwidth*.)

As **Figure D** illustrates, the B channels in an ISDN line move data at transmission rates of up to 64,000 bps per channel—before any sort of data compression. ISDN's smaller D channel manages the B channel connections and control information, such as a busy signal, and connection information. Since the D

channel demands only 16 Kbps to check to see if a line is busy, the connection is much more efficient for the phone companies to handle and, therefore, faster. As a result, ISDN's digital communication lets your computer create nearly instant connections to other ISDN services, such as your Internet provider.

An ISDN line to your home or office costs a little bit more than traditional analog phone lines do right now. However, the extra advantages over basic analog phone service far outweigh the costs.

Special features

ISDN's multichannel lines provide the ability to make more than one connection at a time. For example, with ISDN, you can talk on the phone with one of the B channels while simultaneously looking up information on the Internet with another. By using equipment designed to do so, you could also bond both B channels to produce a 128-Kbps signal, thus creating a very fast Internet connection from your home or office.

What you need for an ISDN Internet connection

Since ISDN uses technology different from standard modems to transmit information, you'll need some new hardware to take advantage of this digital technology. Your Internet service provider must also have the hardware to support ISDN. In addition, you'll need to ask your local phone company to install an ISDN line in your home or office.

When your phone company installs the ISDN line, you'll need a network termination device—called an NT or an NT-1—to convert the ISDN signal into something your computer can use. An NT-1 will also let you attach other devices to the ISDN line.

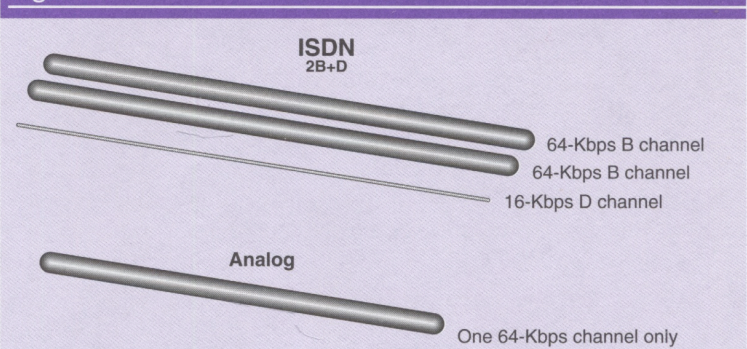
To make the connection from your computer to the NT-1, you need an ISDN terminal adapter (TA)—the digital equivalent of a modem. This TA will connect to the NT-1. Many of the newer TAs include a built-in NT-1. This is a good feature to look for in TAs—especially if you plan to use ISDN for digital communication between computers and the Internet.

You might want to rush out and buy ISDN equipment right away. However, there are a few options you should consider before making your purchases.

Choosing ISDN equipment

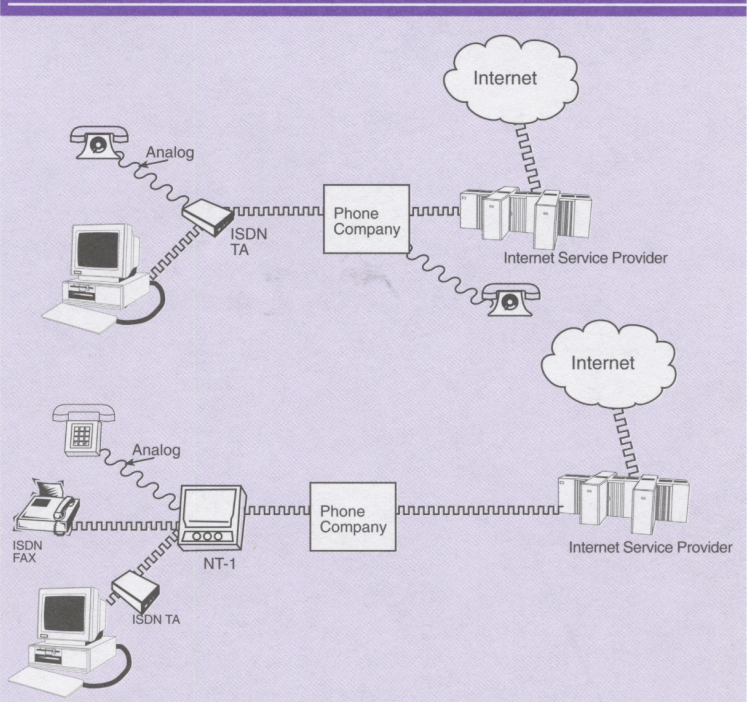
There are several configurations you can choose from when you look for ISDN equipment. For the single user, you can connect your computer directly to a TA with a built-in NT-1 for the easiest and least-expensive solution. For small offices, a TA with an Ethernet connection may provide the best way for more than one computer to connect to the Internet. **Figure E** illustrates just a few of the possible combinations of ISDN-based Internet connections available.

Figure D



ISDN provides two B channels for data and one D channel, which controls ISDN connection information.

Figure E



There are several ways you can implement ISDN.

ISDN equipment needs to interact closely with your local phone company's and Internet provider's hardware. Although most newer ISDN equipment should support a wide variety of standard phone equipment, you should consult your Internet provider before making your final purchase. An Internet provider will most likely have experience with a variety of ISDN options and can guide you to those vendors whose products the provider can support. Your Internet service provider can also give you an idea of how much your ISDN hardware and connection should cost.

The price of technology

All this technology does come at some price. However, that cost isn't as high as you might think. Currently, an ISDN line can cost anywhere from \$40 to \$200 for installation if your local phone company provides the service in your area. Connection fees can run anywhere from \$25 to \$100 per month for a single BRI 2B+D line. Your Internet service provider may

Twice the speed with ISDN BONDING

You can double the speed of your basic-rate ISDN (BRI) connection with a feature called BONDING (Bandwidth ON Demand Interoperability Group). BONDING is a set of protocols that lets you simultaneously use more than one of ISDN's 64-Kbps B channels to make your Internet connection.

For example, if your ISDN terminal adapter (TA) supports the BONDING protocol, you can use both B channels at the same time for a snappy 128-Kbps Internet connection. Most ISDN vendors build BONDING support into the TAs they produce.

also charge an increased rate for ISDN access. Finally, expect to pay prices that start around \$495 and up for a TA with a built-in NT-1.

In order to offset the cost, you can attach regular phones to your ISDN line if you use the right equipment. Some TAs include an analog phone-line connector and the circuitry to convert an analog signal to a digital signal. This lets you plug a standard desk phone into your TA and use it as you would an analog line. Again, your Internet service provider can help you in these matters.

More about ISDN

Even though your service provider can be a rich source of ISDN information, you can do lots of research into this exciting technology via the Internet. Some of those resources include

- The **comp.dcom.isdn** USENET newsgroup
- The **comp.dcom.isdn** FAQ at the address <http://www.crimson.com/isdn/isdnFAQ.txt>
- Bellcore's FTP server at the address <ftp://info.bellcore.com/pub/ISDN/>
- Dan Kegel's ISDN Page at the address <http://alumni.caltech.edu/~dank/isdn/>
- The Combinet ISDN BBS at the address <telnet://isdn@bbs.combinet.com/>

Conclusion

ISDN is an inexpensive way to get a fast Internet connection. With the information we've presented in this article, you'll have a good understanding of what makes ISDN work, what ISDN does, and what you'll need to get started with ISDN. *

Baby talk

The American Academy of Pediatrics is currently sponsoring a pilot Web site to see how well it can use the Internet to disseminate information to its members and the Internet community. The planned test time for the project is six months. You can find the Web site at <http://www.aap.org/dogl/dogl.html>.

WinNews

Microsoft's *WinNews* is a semiregular electronic newsletter that represents Microsoft's views on several topics. It's a useful source of information if you're interested in learning Microsoft's viewpoints.

To subscribe to the *WinNews* newsletter, send an E-mail message to enews@microsoft.nwnet.com. Place the command *subscribe WinNews* in the body of your message when you send the request.

Prodigy's Internet services

With over two million users, Prodigy is one of the largest online service providers. Now, Prodigy offers its new Internet services to Windows users. (Macintosh users will have to wait until later this year.) In this article, we'll take a brief look at Prodigy's Internet offerings and how they perform.

Building the new Prodigy

Prodigy Internet services are additions to the basic software package. In fact, you can expect to see a great deal of the Prodigy interface change in the next few months as Prodigy works to develop its new software interface—code-named P2. Prodigy currently offers these basic Internet services:

- World-Wide Web access
- Usenet newsgroups
- Internet E-mail
- FTP (File Transfer Protocol)
- Gopher

Figure A shows the Prodigy Internet screen. You can get to this screen by using the Prodigy Jump feature and the keyword *Internet*.

Prodigy operates as a distributed network; that is, it maintains several servers all over the country instead of housing all its information in one huge computer complex. Consequently, Prodigy keeps copies of the most recently accessed Web documents and Usenet news feeds at each of its sites. This cuts down on Internet traffic and speeds delivery of information to Prodigy Internet users—a necessary step, since some local Prodigy sites don't yet have the faster 14,400-bps modems necessary to effectively cruise the Web or download large files and news feeds.

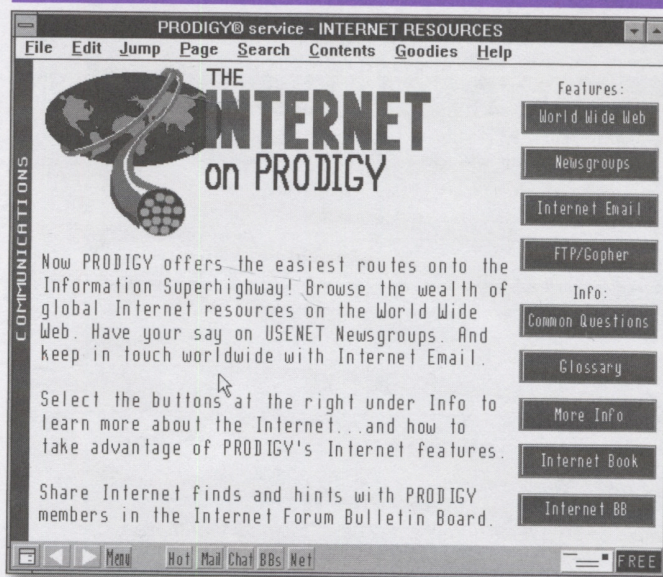
Since IBM and Sears jointly own Prodigy, the service is marketed well to the public and has a large network infrastructure that can connect many parts of the country. As a result, Prodigy has huge potential as a full-fledged Internet service provider.

Prodigy costs \$9.95 per month and includes five hours of connect time in that fee. After the initial "free" time, your Internet connection will cost \$2.95 an hour—a fairly steep rate if you plan to use the service as your primary Internet provider. However,

since Prodigy maintains hundreds of local access sites across the country, it may be the only game in town for Internet access.

As mentioned earlier, Prodigy offers enhancements to its basic software to provide Internet access. The service automatically transfers the necessary files as you request each Internet service for the first time. For example, when you request access to Usenet newsgroups, Prodigy immediately downloads its newsreader software to your PC for you.

Figure A



Prodigy offers many of the basic Internet tools.

Portals and passwords

As we connected to each of the Internet offerings and to Prodigy's E-mail software, we found that Prodigy upgrades its software with each new Internet product you try. Before you can get the upgrade and use any Internet services, however, Prodigy makes you go through a rather puzzling routine.

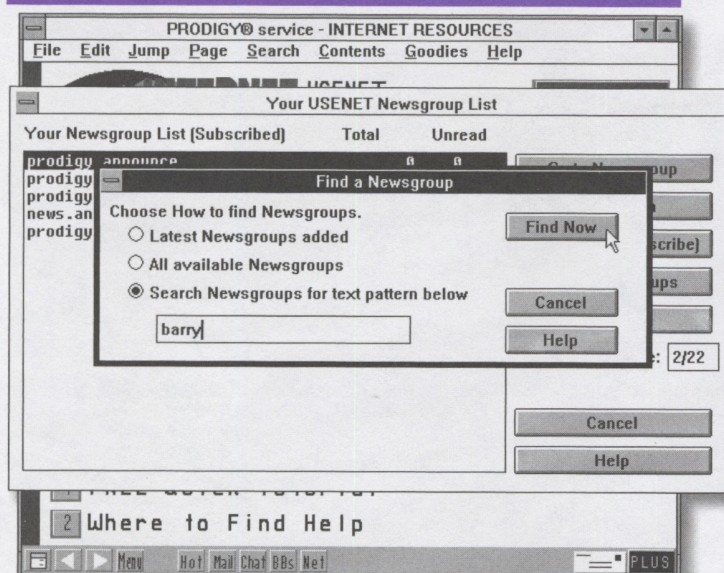
For example, when you select an option to browse the Web or access Usenet newsgroups, Prodigy alerts you with the message *This feature may contain uncensored, adult-oriented content*. Since several persons—including children—can log in with individual IDs under a single account, Prodigy requires you to exercise your parental options and allow or disallow Internet access for each of the login IDs.

Once you configure the service to access a particular Internet application, you'll receive the software for that option. Let's look at some of these applications, beginning with Usenet newsgroups.

Prodigy and the news

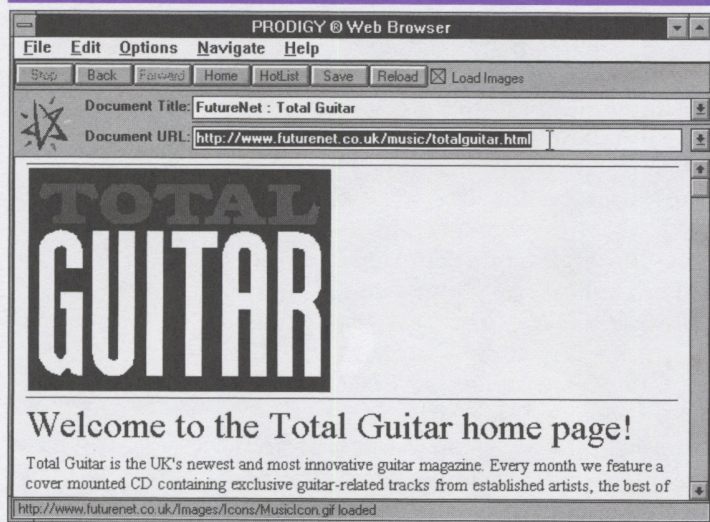
Prodigy's newsreader is basic. By default, the service subscribes you to its support newsgroups. To easily search for other newsgroups, Prodigy includes a Find feature as

Figure B



The Prodigy newsreader includes a few basic features that make working with newsgroups easier.

Figure C



Prodigy's Web browser offers no-frills connectivity to Web, Gopher, and FTP sites.

part of its suite of newsgroup-handling features. As you can see in Figure B, the Find feature can search through all available newsgroups for any particular text pattern.

Other obvious features are the ability to download individual messages or threads of messages to a text file, an option to ignore messages from a particular individual, the ability to view messages sent since a particular date, and a customizable signature file the service appends to the end of each message.

The Prodigy newsreader's feature set could use a bit of polish. However, many of the basics necessary to get into and use newsgroups exist. If Prodigy adds the ability to save multiple messages to disk so you can read your messages offline, for example, the service may become more attractive.

Prodding the Web

If you grow tired of the Usenet E-mail-based discussion groups, you can check out the most exciting feature of Prodigy's Internet offerings—its Web browser. Prodigy's Web browser provides the interface for many of its Internet features, including Web, Gopher, and FTP access. As with the newsreader software, Prodigy copies the Web browser software to your hard drive after you request it.

In terms of performance, Prodigy's Web browser—shown in Figure C—isn't on par with many commercial browsers such as Netscape, MacWeb, or the various licensed versions of NCSA's Mosaic. The Prodigy browser supports the more common features such as forms (so you can fill out all those Internet questionnaires and query documents) and the ability to save a Web page's Hypertext Markup Language (HTML) source code (although this isn't plainly referenced in the menus).

Prodigy's browser works, but at present, it's fairly rudimentary. Fortunately, Prodigy can easily supply its users with upgrades. The browser doesn't yet support many Web features, such as *mailto:*, an HTML tag that allows you to call up a message window simply by clicking on a Web page link. Also, the style-tag definitions don't seem to make much sense. For example, the Prodigy Web browser's Heading 2 HTML style looks exactly like the smallest heading style—Heading 6. In addition, clickable image maps don't yet work correctly.

Finally, Prodigy software is severely limited by modem speed. At the local node's

top speed of 9,600 baud, an average-sized (40-KB) image takes over a minute to load. We hope that the release of the upcoming P2 upgrade will relieve this speed issue and provide other needed enhancements.

Conclusion

The Prodigy Internet interface is a good first effort. However, in its present state, you'd

more likely get better performance through a true Internet service provider. Since Prodigy maintains hundreds of local connections all over the country, many people may opt to use it as their primary Internet provider. Once new software upgrades arrive, faster modems are online, and the prices fall, Prodigy may very well be a large piece of the Internet service-provider business in many US cities. *

Playing MPEG movies on your computer



Are you aware that your computer can play movies? All you need is a movie file and a utility to view the movies. In this article, we'll give you some background on how you can use the Internet to collect and view movie files. In particular, we'll discuss the MPEG (Moving Pictures Experts Group) movie format. We'll also list some movie-playing utilities and show you where you can find movie files for your computer. Let's start with a brief look at digital movies and their background on the Internet.

The big time

The idea of making movie files available on the Internet has—as has much of the Internet's gain in popularity—been fueled by multimedia-capable Internet applications, such as Netscape, NCSA Mosaic, and Mosaic's many licensees. The drawback of multimedia Internet applications is that they often create the need to move larger files from the Internet to your computer. Moving those files quickly is often difficult. Larger files require more *bandwidth* (the amount of information your computer can receive from the Internet in a second), and movie files are among the biggest you can find on the Internet.

As more people and businesses make faster connections to the Internet, we have the luxury of working with technologies that require lots and lots of bandwidth. Loosely translated, "lots and lots of bandwidth" equates to the fastest modem or Internet connection you can possibly afford. Movie files, because they're often so huge, require

that you have a great deal of bandwidth—or a great deal of patience.

Even if you don't have the latest-and-greatest digital modem or router, you can still get movies from several sources on the Internet. But pulling these images across the Internet may take some time with most modems—typically the 14.4-Kbps (kilobits per second) or V.32bis variety. After all, movie files are one of the largest data types you can find. Out of this need to pour vast quantities of data into—and out of—a computer, MPEG was born.

Worth a thousand bytes

Video and audio information takes up a lot of disk space when you put it into digital format. Without some way to reduce that space requirement, we couldn't use these types of information on the Internet—or even on a desktop computer. MPEG formatting is a method of data compression and decompression that squeezes video and audio data to a fraction of its original size. The amount of compression depends on the particular piece of video or audio data that's compressed. However, you can expect close to a 25 to 1 ratio on video data and a 6 to 1 ratio on audio data with the current version of MPEG compression.

Even so, movie files on the Internet often weigh in at several megabytes. You'll want the fastest modem or Internet connection you can find to move those files into your computer. But you'll first need some software to play those movies.

The player

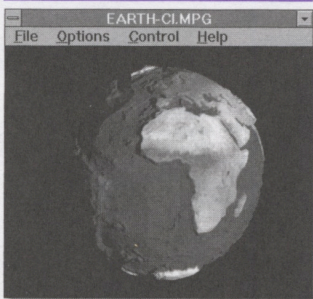
To see a movie, you need a viewing utility, often referred to as a *player*. The player you need and its supporting software depend on the type of computer you use and the type of file you wish to view. There are players available for Macs, Windows PCs, and various UNIX implementations. Let's start with the Macintosh.

Figure A



Sparkle uses standard Macintosh movie controls to play back your MPEG movies.

Figure B



VMPEG is a fast MPEG viewer for DOS, Windows, and Windows NT users.

An MPEG viewer for the Macintosh

Sparkle, a freeware program written by New Zealander Maynard Handley, is currently the standard Macintosh Internet MPEG movie viewer. It uses the standard Macintosh QuickTime movie controller as the basis for its interface, as shown in **Figure A**.

When you encounter an MPEG movie on a Web page, many browsers such as MacWeb, Netscape, and NCSA's Mosaic use Sparkle to play MPEG movies. Sparkle's 2.3.1 release requires that your Mac have

- System 7
- QuickTime 1.6 or later
- Sound Manager 3.0
- A 68020 computer or better
- At least 1,200 KB of free RAM

According to the documentation that accompanies

Sparkle, the next release may require that Mac users upgrade to System 7.5. You can use File Transfer Protocol (FTP) to receive a current copy of Sparkle. Use any of these Internet locations:

<ftp://ftp.utexas.edu/pub/mac/graphics/sparkle-231-fat.hqx>
<ftp://gatekeeper.dec.com/.3/net/infosys/Mac-Mosaic/Helpers/>
<ftp://sumex-aim.stanford.edu/info-mac/grf/util/>
<ftp://ftp.ncsa.uiuc.edu/Mac/Mosaic/Helpers/>
<ftp://freebsd.cdrom.com/.13/mac/umich/graphics/graphicsutil/>
[gopher://gopher.archive.umich.edu:7055/11/mac/graphics/graphicsutil/sparkle 2.3.sit.hqx](http://gopher.gopher.archive.umich.edu:7055/11/mac/graphics/graphicsutil/sparkle%202.3.sit.hqx)

MPEG viewers for Windows and DOS

MPEGPLAY, written by Michael Simmons, is a good MPEG viewer for Windows users. The latest version of MPEGPLAY (1.61) requires that your Windows 3.1 installation include the 32-bit Windows enhancements—Win32 version 1.15a or later. (The **mpegw32g.zip** archive includes the Win32 enhancements.) MPEGPLAY also works under Windows NT version 3.5 or later.

You can find MPEGPLAY at several sites on the Internet. Look for the **mpegw32h.zip** file at these Internet locations or in many CICA mirrors:

<ftp://ftp.ncsa.uiuc.edu/Mosaic/Windows/viewers/>
<ftp://gatekeeper.dec.com/pub/micro/msdos/win3/desktop/>
<ftp://ftp.orst.edu/pub/mirrors/>
<ftp://ftp.cica.indiana.edu/win3/desktop/>
<ftp://ftp.netcom.com/pub/ms/msimmons/>

You can also use FTP to obtain MPEGPLAY at <ftp://papa.indstate.edu>. Look in the **/winsock-1/WWW-Browsers/Players/** directory for the file **mpegw32h.zip**.

Both Windows and DOS users can take advantage of a program called VMPEG12a, which is shown in **Figure B**. Version 1.2a of the program provides about a 30-percent speed improvement over previous releases. VMPEG12a requires a PC with a 386 or better processor and at least 4 MB of RAM. You can find VMPEG12a at <ftp://ftp.netcom.com/pub/cf/cfogg/mpeg1/vmpeg12a.zip>.

MPEG players for UNIX or VMS

The FTP site at [s2k-ftp.cs.berkeley.edu](ftp://s2k-ftp.cs.berkeley.edu) maintains MPEG players for several platforms. Look in the **/pub/multimedia/mpeg/Ports/** directory for a player that will work for you.

More MPEG Information

You can find more information about MPEG and other audio and visual formats at several Web sites. Some URLs that can help you find your way into digital movie technologies include

<http://www.eit.com/techinfo/mpeg/mpeg.html>
http://cui_www.unige.ch/OSG/MultimediaInfo/
<http://random.chem.psu.edu/mpeg.html>

If you're cruising the Internet with a graphical Web browser, you'll probably want to configure it to play MPEG movies on demand. Each browser will require a slightly different procedure to do so.

Configuring a Web browser

Windows users will need to tell their particular Web browser how to recognize and play movie files automatically. If you use NCSA's Mosaic for Windows, you can find these instructions online at

<http://www.ncsa.uiuc.edu/SDG/Software/WinMosaic/viewers.html>

If you use one of the other popular Web browsers, look to the home pages of the company or the organization that develops your software for specific instructions. Some Web browsers, such as Netscape, will prompt you to configure a helper application for viewing MPEG movies if one isn't already set up.

Working with text-based interfaces and MPEG

If you use Lynx, DOSLynx, Gopher, or simple command line-driven FTP to get your files, you don't need to worry—as long as you can run the player on your computer, you can still get and play MPEG movies. All you need to do is download the player to your personal computer, install it, and then get some MPEG movies. Just because you don't use a graphical Web browser doesn't mean you're out of the graphics game. As a matter of fact, you may find that you can download files to your personal directory much more quickly. Then, you can download those files to your own computer when it's more convenient.

If you configure your browser to accept MPEG movies or simply download the MPEG player and use it as a stand-alone application, you'll want to gather some MPEG movies to play. You'll find more and more movie files available on the Net every day.

Collecting movies

You can collect movies from many Internet resources: FTP sites, the World-Wide Web (using your Web browser), and Gopher. The s2k-ftp.cs.berkeley.edu FTP site contains a number of MPEG files. Look for files that end with **.mpg** or **.mpeg** extensions. You'll find some in the **/pub/multimedia/mpeg/movies** directory.

The Web includes numerous sites that provide MPEG files. A few places you might look include

<http://www.ccsf.caltech.edu/~johns/sl9.html>
<http://newproducts.jpl.nasa.gov/sl9/images.html>
<http://seds.lpl.arizona.edu/sl9/sl9.html>
http://mtvodditie.viacom.com/animate_t.html
<http://s2k-ftp.cs.berkeley.edu:8000/multimedia/mpeg/movies/>
http://ice.ucdavis.edu/whimsy/fun_stuff/fun_stuff_movies.html
<http://www.best.com/~johnp/fun.html>
<http://www.wit.com/>

Gopher and FTP sites offer several MPEG libraries to choose from. Start by searching in your local Gopher archives for MPEG information. Then, check out the offerings at

<gopher://ftp.cs.ttu.edu/11/pub/mpeg/movies>
<gopher://epoch.CS.Berkeley.EDU:70/11/multimedia/mpeg/movies>
<gopher://samisdat.unh.edu:70/1/internet/mpeg>
<ftp://havefun.stanford.edu/pub/mpeg>

Playing the files

Playing MPEG movies is easy. After you collect the files you think will be interesting, simply start up your MPEG viewer and load your movie. If you use a Web browser to locate MPEG movies, you can usually view the movie immediately from your browser.

As you play back an MPEG file, you may notice that at some points the action will seem jerky. To reduce this phenomena, you should keep a few things in mind. The following tips will increase the performance of your movie players:

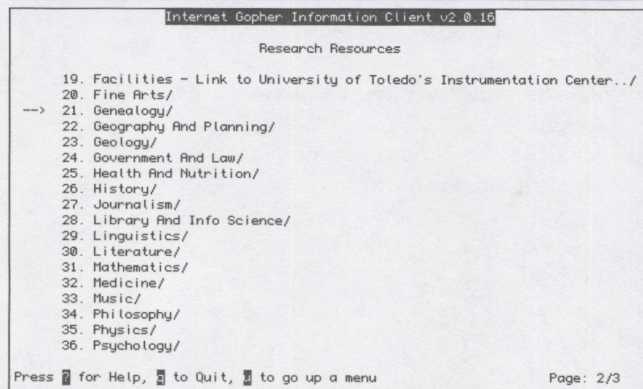
- More memory provides you with better performance.
- A faster Microprocessor (RISC/Pentium/PowerPC) will outperform a slower PC.
- Some MPEG programs perform better than other programs do.

Conclusion

Consumer digital video technology, such as MPEG and QuickTime, is in its adolescence. As more developers embrace these architectures and standards, the image quality and performance will also improve. *

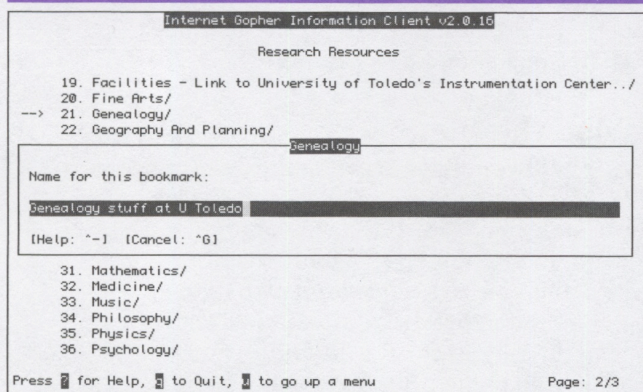
Working with bookmarks in Gopherspace

Figure A



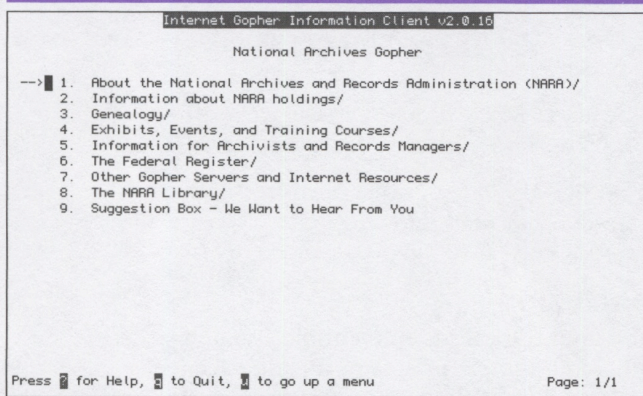
You can easily add a Gopher menu item to your Gopher bookmark list.

Figure B



Your UNIX Gopher client will prompt you for a title for each bookmark you create.

Figure C



The A keystroke will create a bookmark to the current Gopher menu list.

Most Gopher users have the ability to create bookmarks. In this article, we'll show you how to create and use Gopher bookmarks. In addition, we'll show you how you can share your Gopher bookmarks with others.

"X" marks the spot

Tunneling is a term that many Internet surfers use to describe what they do when they look for information by using a Gopher client. Tunneling for just the right piece of information may take hours. However, once you unearth the valuable piece of information, you may not remember how you found that jewel. What you need is a "treasure map." A bookmark is just that—a powerful tool you can use to return you instantly to where you've found jewels in Gopherspace.

Creating a bookmark

Creating a bookmark in most Gopher programs is easy. For this example, we'll use a UNIX Gopher client similar to the kind many shell account users work with. (However, every Gopher client program we've seen includes the bookmark feature.)

You can use several bookmark techniques as you tunnel through Gopherspace. **Table A** in the sidebar "Common UNIX Gopherspace Commands," on page 12, lists some of those features.

Each option is both a simple and a powerful feature. For example, you can easily add a Gopher menu item to your bookmark list. To do so, begin by starting your Gopher client. You'll then need to connect to a Gopher server. In this example, we'll connect to the Genealogy archive at the University of Toledo. You can find this archive at alpha.cc.utoledo.edu.

From your UNIX prompt, type

`gopher alpha.cc.utoledo.edu`

and select the **Research Resources** menu option. At the Research Resources screen, move your cursor down a page to the Genealogy option, as shown in **Figure A**.

To add the Genealogy option to your UNIX Gopher client's bookmark list, simply

press the letter *a*. The Gopher software will then display a dialog box, as shown in **Figure B**, that prompts you to give this link a name. The name you give this link will appear in your bookmark list, so you can make it as descriptive as you need.

Marking the current page

The *a* bookmark option takes you only to the item that's currently selected. However, you may often find yourself at an entire page of information that you want to mark, such as the menu shown in **Figure C**. Fortunately, the *A* option (note the capitalization) handles just such a need.

In this instance, you'd want to title your bookmark to reflect the entire page of information, not just the selected item. We titled the menu in **Figure D** *National Archives Gopher*. This will display in our Gopher bookmark screen.

Using your bookmarks

Using your bookmarks in your UNIX Gopher software is simple. To call up your bookmarks, press *v*. A list similar to the one shown in **Figure E** will appear. You use this menu as you would any other Gopher menu—simply move the selection and press [Return].

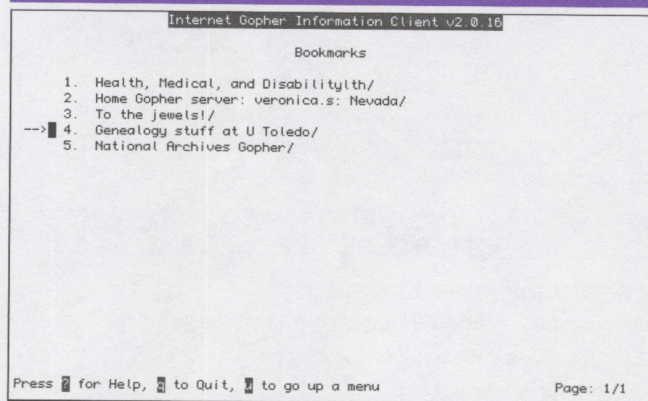
Sharing your bookmarks with others

You may want to share your Gopher bookmarks with someone who hasn't yet discovered the bookmark feature or who has interests similar to your own. To do so, you can forward a copy of your Bookmarks file.

The UNIX Gopher usually maintains a file—.gopherrc—in your user directory. You can copy this file and give it to other people who use the same UNIX Gopher software as you do. They, in turn, can copy the bookmark information from the file into their own .gopherrc files—or simply use your file instead.

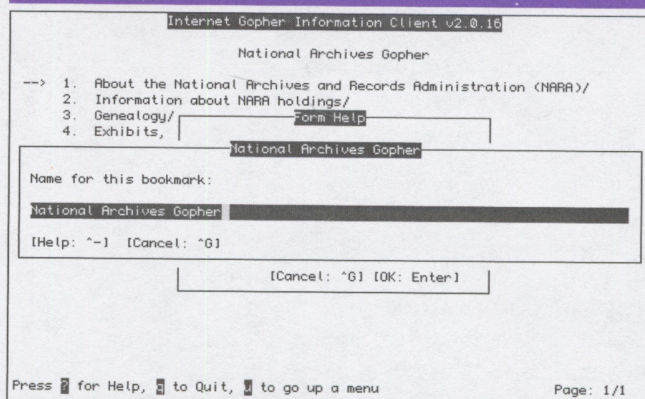
If someone uses another Gopher client program, they can still benefit from your Gopher bookmark file's information. This file contains all the information that a person (or Gopher) needs in order to find a resource in Gopherspace. You can print your Gopher Bookmarks file, then simply hand the print-out to anyone who may find your links useful. **Figure F** shows an example of the data a bookmark file contains. *

Figure D



*Title your bookmarks to reflect the current screen of information when you use the *A* option.*

Figure E



You use your Gopher Bookmarks file as you would any Gopher menu.

Figure F

```
bookmarks:
#
Type=1
Name=Genealogy stuff at U Toledo
Path=1GOPHER_ROOT:[000000.RESEARCH-RESOURCES.genealogy]
Host=Alpha.CC.UToledo.edu
Port=70
#
Type=1
Name=National Archives Gopher
Path=
Host=gopher.nara.gov
Port=70
```

The Gopher Bookmarks file contains all the information a person needs to direct any Gopher client program to a resource in Gopherspace.



Common UNIX Gopherspace commands

We covered the Gopher bookmarks feature in "Working with Bookmarks in Gopherspace." However, a typical UNIX Gopher program includes several helpful options to aid in your Gopherspace excursions. Table A lists many of these useful Gopher controls.

Table A

Gopher bookmark commands

- a Add the currently selected line item to the bookmark list.
- A Add the currently active page or directory to the bookmark list.
- v View the bookmark list.
- d Delete the selected bookmark entry.

Gopherspace navigation controls

Use the ↑, ↓, ←, and → arrow keys to move around menus.

- | | |
|----------------------|---------------------------------------|
| →, Return | Enter/Display current selection. |
| ←, u | Exit current item or move up a level. |
| ↓ | Move to the next line. |
| ↑ | Move to the previous line. |
| >, +, Pgdn, Spacebar | View the next page. |
| <, -, Pgup, b | View the previous page. |
| 0-9 | Go to a specific line. |
| m | Go back to the main menu. |

Other Gopher commands

- q Quit with an "Are you sure?" prompt.
- Q Quit immediately.
- s Save the current item to a file.
- S Save the current menu listing to a file.
- D Download a file.
- r Go to the root menu of the current item.
- R Go to the root menu of the current menu.
- = Display technical information about the current item.
- ^ Display technical information about the current directory.
- o Open a connection to a new Gopher server.
- O Change configuration options.
- f Connect to an anonymous File Transfer Protocol (FTP) host.
- / Search for an item in the menu.
- n Find the next search item.
- g "Gripe" via E-mail to the administrator of the current item.
- !, \$ Use shell escape (UNIX) or Spawn subprocess (VMS).
- [Ctrl]T Show the host Gopher server's local date and time.
- [Ctrl]L Redraw or wipe the screen (cleans up messy screen displays). You can also use [Ctrl]R and [Ctrl]W.

You have many options to help you navigate through Gopherspace and collect information when using a UNIX Gopher client.

An index to your favorite magazines

The Tables-Of-Contents Gopher site distributes the tables of contents and cover images of over 150 computer, sports, electronic and computer game, and music and entertainment magazines.

Cyberspace Publishing, who provides the service, updates the information once a week. Some of the publications the service references include *Computer Gaming World*, *Sports Illustrated*, *Scuba Times*, *MacUSER*, *PC World*, *Guitar Player*, *Keyboard*, and *Cinquantastique*. To access the Tables-Of-Contents Gopher site, point your Gopher client to mag-browse.com.

Online forum for information technology managers

The Center for Information Systems Management at the University of Texas in Austin maintains a home page on the World-Wide Web directed to those persons interested in managing Internet-related information technology issues. The URL to the Web site is <http://cism.bus.utexas.edu>.

Contacting *Inside the Internet*

Please send us your comments, questions, ideas, suggestions, requests, and hot Internet tips. Thousands of other people on the Internet may have the same questions you do, so make yourself known. You can reach *Inside the Internet's* editorial staff via E-mail at

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URLs in *Inside the Internet*

We often use a uniform resource locator, or URL, when we describe how and where to find a particular piece of information on the Internet. In general, a URL consists of two parts, and each part tells something about how you can access a piece of Internet-bound information. These pieces include the protocol or scheme you'll use to access the resource, and the protocol- or scheme-specific information that leads you to that resource.

The scheme

The protocol portion of a URL denotes the type of application or protocol you should use to get to a particular Internet resource or piece of data. Most schemes follow the format

`protocol://`

Common protocol types you'll encounter in *Inside the Internet* include

- | | |
|--|------------------------|
| • Gopher | <code>gopher://</code> |
| • Hypertext Transfer Protocol (World-Wide Web) | <code>http://</code> |
| • Telnet | <code>telnet://</code> |
| • File | <code>file://</code> |
| • File Transfer Protocol | <code>ftp://</code> |

We'll occasionally refer to other schemes in a URL, such as mail or news. For more information on other accepted protocol types and URL schemes, look to the *Uniform Resource Locators: Specific Schemes* page at

http://info.cern.ch/hypertext/WWW/Addressing/URL/4.1_Schemes.html

Scheme or protocol-specific information

You can usually break a URL's scheme or protocol-specific information into two smaller parts: the server name and the path to the file or resource.

The server name

The server name portion of the URL identifies the server or machine that handles the resource or information. This portion can optionally include the server application's

port number, which is a logical address assigned by the server operator to the server program. For example, you can point to a Web site that runs on port number 8080 (the default is 80). In this case, the address will look something like

`http://the.server.name:8080/`

Moreover, this portion can include the user ID and password information. For example, a URL that points to your personal FTP directory (and so must include your user ID and password) might read

`ftp://userid:password@the.server.name/user/
userid/`

You'll rarely find user IDs and passwords in a URL. Many Internet services we mention in *Inside the Internet* don't require special user ID or password information.

The path and filename extension

A URL can optionally include a piece of information's path and filename. This path can include details—based upon the protocol used—that help your software navigate to specific information. The extension portion of a filename often supplies clues your Internet applications use to determine how to handle a piece of data found on the Internet.

For exhaustive detail on URLs, read RFC 1738, *Uniform Resource Locators (URL)*, December 1994, by Tim Berners-Lee, Larry Masinter, and Mark McCahill. You can find a copy of the RFC at

<ftp://ds.internic.net/rfc/rfc1738.txt> *

On the lookout

Quarterdeck recently released beta versions of its Mosaic for Windows and WebAuthor extensions for Microsoft Word for Windows. Both of these products look good in beta mode and should be available soon as retail products.

Quarterdeck has demo versions of both the Web browser and the HTML editing product on the <ftp.qdeck.com> File Transfer Protocol (FTP) site in the `/pub/normandy/` directory. Unfortunately, the beta copies you get from this site will cease to function after a short period. You can choose to purchase either of the products at that time.

Roadside café

PNG—graphic successor to CompuServe's GIF

If you're interested in producing your own World-Wide Web documents, you'll want to closely track the controversy that's behind CompuServe's Graphics Interchange Format, more commonly known as GIF. GIF is a common file format that many Internet sites use for graphic images.

Recently, Unisys, a company that claims the patent for the Lempel-Ziv-Walsh (LZW) compression algorithm, announced that it will sue for patent fees all developers that sell software using GIF technology. Those applications include many graphics packages and Web browsers. GIF uses LZW compression to create smaller file sizes and was originally developed so CompuServe members could move graphic data to and from that service quickly.

CompuServe placed the GIF specifications in the public domain, so software developers could include the ability to read and write the

GIF file format without paying licensing fees. As a result, almost every Web browser can decode and display GIF images.

Now that Unisys has filed a patent suit, developers must pay royalties for any software that reads GIF files, including shareware and freeware applications. The cost of that technology suit will eventually pass to consumers. As a result, new graphics format standards are evolving that developers can use without the additional costs GIF now incurs.

Portable Network Graphics (PNG), a graphics compression format that will soon replace the GIF standard, should be patent-free and contain a number of enhancements, including better color depth. PNG—pronounced *ping*—is also known as the CompuServe GIF24 format.

For more information about PNG, the GIF issue, and other graphics formatting information, look to the URLs <http://www.w3.org/hypertext/WWW/Graphics/Overview.html> and <http://sunsite.unc.edu/boutell/png.html> or the Usenet newsgroup comp.graphics.

In past issues

January 1995

- "How to Make Your Own Mosaic Pages"
- "A Closer Look at Internet In A Box"
- "Finding the Right Kind of File with Gopher and Veronica"
- "Turning Your Boring Shell Account into a Graphical Connection with TIA, The Internet Adapter"

February 1995

- "Avoiding Junk-Mail from LISTSERV Mailing Lists"
- "Creating Lists for Your Web Documents"
- "Adding List Types Within Lists"
- "Desktop Publishing Tips on the Internet"
- "Accessing the World-Wide Web via E-mail"
- "Use E-mail to Get Documents That Load into a Web Browser"
- "Work with the Purdue OWL to Improve Your Writing Skills"
- "WSGopher—The 'Cool Tool' in Gopherspace"
- "The TurboGopher Is Back"

In coming issues

- A modem primer
- E-mail tips
- ISDN product reviews
- Netscape's extended HTML tags
- PGP, Pretty Good Privacy
- PPP

What's your D&B?

The financial firm of Dunn and Bradstreet (D&B) maintains a Web site where you can get expert advice on topics such as tactical marketing, vendor management, or job hunting. You can reach the D&B Web site at

<http://www.dbisna.com>

I spy you!

An Executive Order signed by President Clinton on February 23, 1995, authorizes the declassification of satellite photographs collected by the US intelligence community in the 1960's and early seventies. More than 800,000 declassified images will make their way onto the Internet in the next 18 months. Photographs will be available from the National Archives Record Administration (NARA) and from the US Geological Survey's Earth Resources Observation System (EROS) Data Center. You can use anonymous FTP to find the first of these images via the Web at

<http://edcwww.cr.usgs.gov/dclass/dclass.html>

and at

<ftp://edcftp.cr.usgs.gov/pub/data/DCLASS/>

Medical resources on the Internet

Inside the Internet readers often request information about Internet medical resources. These requests often range from pointers to home remedies to in-depth medical research on a variety of topics.

You can find a collection of links to several health- and medical-related resources from various Internet sites. You can find some of these sites listed in **Table A**. For example, the University of California at Irvine maintains a large list of Gopher-accessible sites. If your preference is to use a Web browser such as Lynx, Netscape, or Mosaic, you can find a wealth of resources in the Pharmacy Page at the University of Oklahoma.

Table A

Gopher medical resources

Title: MEDICINE on the Internet
Server: peg.cwis.uci.edu
Port: 7000
Type: 11
Selector: /gopher.welcome/peg/MEDICINE
URL: gopher://peg.cwis.uci.edu:7000/11/
gopher.welcome/peg/MEDICINE

Web medical resources

<http://golgi.harvard.edu/biopages/medicine.html>
<http://www.cpb.uokhsc.edu/pharmacy/pharmint.html>

You can find several health-related resources on the Internet.

Looking for someone at any price?

Move over George Orwell! You can now enlist the help of Find A Friend, an Internet agency that can help locate a friend, relative, or other individual you've lost track of. For \$18, Find A Friend will search for your quarry through information it collects from public and proprietary databases. These databases include credit card information, phone directories, county deed records,

direct-marketing information, consumer magazine circulation records, and various national change-of-address files.

If ACG/Computech Direct, the company that manages Find A Friend, can't locate the person you're looking for, you won't be charged. You can access Find A Friend on the Web at

<http://www.ais.net:80/findafriend/>

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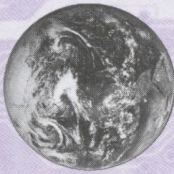
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Get to the roots of your past with Gopher and the Web

Several Internet sites offer good genealogical information. The University of Toledo's Gopher site is an excellent place to start when researching your family tree. In addition, the site maintains links to several other Internet sites that manage historical and genealogical material.

If you have a UNIX shell account, you can access the University of Toledo site from your Gopher client by pressing [Ctrl]o and entering the host address **alpha.cc.utoledo.edu**

and the default port, **70**. Once you connect to that Gopher server, open the **Research Resources** menu item and select **Genealogy**.

The National Archives Record Administration (NARA) maintains both Web- and Gopher-accessible links to genealogical data. To access these services, point your Gopher client to **gopher.nara.gov**, port **70**. Point your Web browser to **http://gopher.nara.gov/1/servers/genealog** for the HTML (Hypertext Markup Language) version of the list.

Inside the Internet Glossary

In *Inside the Internet*, we use several terms that may seem uncommon, since you may not hear many Internet terms used in the "real" world. We've most likely discussed many of these terms in past issues. However, for everyone's benefit, we'll use a glossary (which will become an ongoing feature) to explain terms, ideas, and other pieces of information that relate to Internet issues and topics.

Bandwidth

The volume of information (measured in cycles per second—hertz—or bits per second—bps) that a computer, medium, or transmission device such as an ISDN terminal adapter or modem can handle in a given period of time.

GIF (Graphics Interchange Format)

A compressed graphics file format.

HTML (Hypertext Markup Language)

A simple text-based generic markup language for representing the design and contents of documents that World-Wide Web browsers can display.

HTTP (Hypertext Transport Protocol)

A fast, efficient information retrieval protocol designed to distribute information quickly to as many users as possible.

ISDN (Integrated Services Digital Network)

A fast digital technology designed to replace inefficient analog phone lines and modems.

JPEG (Joint Photographic Experts Group)

A compression format designed to compress either full-color or gray-scale digital images.

Kbps (kilobits per second)

A measurement representing 1,024 bits of information per second. In phone applications such as ISDN, Kbps represents 1,000 bits per second.

MPEG (Moving Pictures Experts Group)

An organization that maintains a digital video format allowing movies to play on a computer.

QuickTime

A time-based technology designed to acquire and deliver digitized audio and video information quickly and efficiently.

TA (terminal adapter)

An interface between your computer and an ISDN connection. TAs can be internal or external devices. Think of a TA as a cross between a network interface card and a modem.

URL (uniform resource locator)

A pointer to a resource that's available through the Internet.